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CONTRIBUTIONS TO OUR KNOWLEDGE OF THE
BRITISH BRACONIDÆ. No. 2.—MACROCENTRIDÆ,
WITH DESCRIPTIONS OF TWO NEW SPECIES.

By G. T. LYLE, F.E.S.

(PLATE VI.)

THE insects of this small family were first separated from *Rhogas* by Curtis in 1832 and 1833,* when he brought forward the genera *Macrocentrus* and *Zele*. Förster proposed two additional genera, the one, *Amicroplus*, a division of *Macrocentrus*, and the other, *Homolobus*, a dismemberment of *Zele*.† Ashmead has raised the genera of Curtis to the dignity of tribes,‡ which is quite necessary if Förster's genera be accepted, for a glance will show that *Amicroplus* and *Homolobus* cannot rank equally with *Macrocentrus* and *Zele*; indeed, Marshall considered that Förster's genera were founded on characters purely specific.§ Our few British species may, for convenience, be treated under the two original genera:—

Abdomen elongate, sessile; fore wings with three cubital areolets, radial areolet elongate.

- (1) Spurs of hind tibiæ very considerably shorter than half the metatarsi; first abdominal segment not or scarcely longer than the second; terebra at least as long as the abdomen MACROCENTRUS.
- (2) Spurs of hind tibiæ as long as half the metatarsi, first abdominal segment much longer than the second; terebra short ZELE.

I must again express my thanks to various entomologists who have presented me with specimens, to Dr. D. Sharp and Mr. H. F. Bailey for the loan of books, to Mr. Claude Morley, who, with his usual kindness, has sent me for inspection several insects from his collection, to Col. Nurse for a similar courtesy,

* Ent. Mag., vol. 1.

† Synop. der Fam. und Gatt. der Braconen. 1862.

‡ "Classification of Ichneumon Flies," Proc. U.S. Nat. Mus., vol. xxiii. p. 118.

§ 'Species des Hym. d'Europe et d'Algerie,' vol. 5, p. 228.

to Mr. R. South for confirming the names of hosts, and to Mr. B. S. Harwood, of Colchester, who has sent me for examination a considerable number of specimens, most of which have come to him from the collection of the late E. A. Fitch. Although the main part of the Fitch collection is now in the Essex Museum at Stratford, it would seem that the insects which are at present in the possession of Mr. Harwood were put on one side in store-boxes, some as duplicates and others as being unnamed, or to await naming, and have so remained for the past twenty years or more.

In the following notes, unless otherwise stated, the records are my own, and the insects mentioned have been captured or bred in the New Forest.

MACROCENTRUS, Curtis.*

Gregarious or solitary parasites of larvæ of Lepidoptera. Ratzeburg records one species as having been bred from the coleopteron *Anobium pertinax*, but this has never been confirmed. The general colour of these insects is black with rufous or testaceous markings. In the few cases where I have noticed the larvæ, they have been elongate and whitish without any very noticeable markings. It is possible that in all the species the larvæ may be partially external parasites, for with *M. abdominalis* and *M. equalis* I have found that, although internal feeders when small, the larvæ feed for three or four days as external parasites after emerging from their host, during which time they rapidly increase in size.

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| (8) | 1. Antennæ with forty-five or more joints. | |
| (3) | 2. Third abdominal segment (like the two preceding) entirely striolate | 1. <i>abdominalis</i> (Fab.). |
| (2) | 3. Third abdominal segment smooth, or striolate at base only. | |
| (7) | 4. Body entirely black. | |
| (6) | 5. Stout species, wings clouded | 2. <i>marginator</i> (Nees). |
| (5) | 6. Slender species, wings hyaline | 3. <i>nitidus</i> (Wesm.). |
| (4) | 7. Thorax rufous | 4. <i>thoracicus</i> (Nees). |
| (1) | 8. Antennæ with forty or less joints. | |
| (12) | 9. Second abscissa of radius as long as the first intercubital nervure. | |
| (11) | 10. Body entirely black, terebra longer than body | 5. <i>infirmus</i> (Nees). |
| (10) | 11. Thorax partly rufo-testaceous, terebra not longer than the abdomen | 6. <i>equalis</i> (sp. nov.). |
| (9) | 12. Second abscissa of radius much shorter than first intercubital nervure | 7. <i>collaris</i> (Spin.). |

M. abdominalis, Fab.†—Without doubt the commonest species in the genus, having now been recorded as bred from nearly

* Ent. Mag., vol. i., p. 187.

† Ent. Systematica, 2, 183.

thirty different species of Lepidoptera. A gregarious parasite, generally of the larvæ of Tortricina or Tineina. This is the *Rogas linearis* of Wesmael,* from whose description and that of Marshall † I have identified my specimens, not having seen the original description of Fabricius. Marshall describes four distinct varieties, and although the numerous broods that I have reared in the New Forest have all been typical, I have captured the var. *pallipes*. It is recorded that Van Vollenhoven bred this variety mixed with typical specimens from the same victim, which is quite contrary to my own experience, nor is it borne out by the many broods from the Fitch collection which I have examined. It has often been stated that the broods invariably consist of one sex only, and so I had always found them until July, 1914, when, from a larva of *Tortrix ribeana*, I obtained a brood composed of a single male and eighteen females; the male appeared some thirty-six hours before any of the females.

In some specimens I find that the striolation at the base of the third abdominal segment is very faint. As a rule, the second cubital areolet is open outwardly, that is, the second cubital nervure is obsolete. I have a specimen of the var. *pallipes*, however, which has the second cubital areolet distinctly closed.

The cocoons are brown, thin, shining and enveloped in a thin whitish web; they are usually found in bunches between the leaves which have been "rolled" by the hosts. A period of from three to four weeks elapses between the emergence of the parasite larvæ from their host and the appearance of the perfect insects. I have noticed that, after emerging from their host, the larvæ feed as external parasites for two or three days; in fact, until the edible parts of the host are entirely consumed.

Bred from *Tortrix ribeana*, June 23rd, 1911 (eight females), July 3rd, 1912 (twelve females), July 4th, 1912 (thirteen males); from *T. lichæana* (ten females); from *T. viridana*, July 14th, 1912 (six females); from *Depressaria alstromeriella*, July 10th, 1912 (four females). Harwood has two specimens (var. *pallipes*) labelled "ex caja, W. Sherston." In Fitch's boxes are broods obtained by Elisha from *Depressaria nanatella* and *Gelechia mouffetella* (both broods var. *pallipes*); from *Depressaria alstromeriella*; *Gracilaria elongella*, July 14th, 1885; *Cerostoma xylostella*, July 31st, 1882, and *Ebulea crocealis*; also broods from *Ennychia octomaculalis*, September 22nd, 1881, bred by W. R. Jeffery; and from *Botys verticalis*, bred by G. T. Porritt. ‡

M. marginator, Nees. (Fig. 1.)—This is the enemy of the Sesidæ, having been bred as a solitary parasite from the larvæ of many members of the family. It is the largest and stoutest

* Nouv. Mém. Ac. Brux., p. 173.

† Trans. Entom. Soc. 1888, p. 193.

‡ Some of these broods were recorded by Fitch, Entom. xiv. 143, and xvi. 68.

species of the genus to be found in Britain, measuring sometimes as much as 16 mm. across the expanded wings; the size, however, varies, specimens often expanding no more than 12 mm.

It would seem that the female is much more frequently met with than the male; for instance, in February, 1914, L. W. Newman sent me twenty-two living specimens which he had bred (forced, of course) from larvæ of various *Sesidæ*, and all were females, and Col. Nurse, who has bred the species commonly, has obtained females only. My own experience is that the females outnumber the males by ten to one.

The cocoon is brown, thin, and shining, larger, but not so elongate, nor so dark in colour as that of *M. thoracicus*. It is always constructed within the burrow of the host (fig. 8). I have specimens bred by Newman from larvæ of *Sesia vespiformis* and *S. culiciformis*, taken at Bexley; others bred by Tonge from *S. culiciformis*, July 17th to 24th, 1911; from *S. chrysidiformis*, May 22nd, 1911; and from *S. formiciformis*, May 11th, 1912; all the hosts taken near Reigate. Harwood has found it commonly at Colchester, and Nurse in West Suffolk. I have frequently bred it from New Forest larvæ of *S. vespiformis* in May, and have found the cocoons in burrows of *S. tipuliformis* at Burgess Hill, Sussex, and Sherborne, Dorset.

M. thoracicus, Nees.—A well-marked species, easily distinguished by the rufous thorax; always a solitary parasite. In the New Forest it appears to be fairly plentiful, and I have several times bred it in July and August from larvæ of *Phibalocera quercana*, also once from larva of *Chimabacche fagella*, August, 1913. I have captured it in May.

Among Fitch's insects are three males, bred from *Phycis betulella* by H. Bartlett, June 29th, 1880, and June 30th, 1882; also a specimen labelled "Darenth Wood."

The cocoon is dark brown, narrow, elongate, and constructed between the leaves, which are spun together by the host. When bred from *P. quercana*, the cocoon is found under the flat web which the larva of the lepidopteron constructs beneath a leaf.

Marshall states* that Bignell bred it from *Noctua triangulum* and *Xylina ornithopus*; these seem rather unlikely hosts, and it is strange that Bignell makes no mention of them in his South Devon list, but merely states that he bred the species from "larvæ feeding on shallows."

This insect is sometimes confused in collections with *Eubadizon extensor*, L., to which it bears a superficial resemblance.

M. nitidus (Wesm.).—On May 5th, 1910, I captured a female, and on May 15th, 1914, a male which I have no hesitation in referring to this species, not before recorded as British. My

* Trans. Entom. Soc., 1888, p. 196.

specimens agree with Wesmael's description, except that the head, thorax, and stigma are dark fuscous instead of black. Very similar in shape and size to *M. thoracicus*, but differing in that the thorax and stigma are black or blackish, the antennæ 46-jointed, and the second abscissa of the radius not longer than the first intercubital nervure. From *M. infirmus* it differs in size, in the length and number of joints of the antennæ, and in many other ways; from *M. marginator* in size, in the wings being hyaline and not clouded, and also in the first abscissa of the radius being considerably shorter than the first intercubital nervure.

M. infirmus (Nees).—Somewhat similar to *M. collaris*, but differing in having stouter legs, a much longer terebra, and in the second abscissa of the radius being as long as the first intercubital nervure.

In Fitch's boxes are four, one male and three females; these were probably once in Marshall's collection, one card being marked "St. A." (St. Albans) in his writing.*

M. equalis (sp. nov.).

Fuscous, disc of mesothorax rufo-testaceous, third segment of the abdomen fusco-testaceous; palpi pale testaceous in both sexes, mandibles testaceous with fuscous tips; head fuscous except the clypeus which is testaceous; antennæ fuscous, basally testaceous, elongate, 39–40-jointed in both sexes, longer than the body; meta-thorax shagreened: wings hyaline, stigma and nervures testaceous, the former with a darker spot of varying size. *Second abscissa of the radius as long as the first intercubital nervure*; legs testaceous, claws dark: abdominal segments one and two distinctly striolated, first segment scarcely narrowed from the apex to the tubercles; terebra almost as long as the abdomen.

Described from four males and two females.

A gregarious parasite, the cocoons being enclosed in a felt-like oblong ball which assumes the proportions of the pupal chamber of the host. Both males and females in the same brood. This species somewhat resembles *M. collaris*, but is most certainly not the *M. collaris* described by Marshall in *Trans. Entom. Soc.* 1888, p. 197, and *Species des Hym.* vol. 5, p. 238; it agrees more closely with Wesmael's description,† but as Marshall was acquainted with Wesmael's insects, no doubt he was right in the synonymy of his *M. collaris* with *Bracon collaris* of Wesmael; unfortunately, the latter's description lacks any mention of the length of the first abscissa of the radius or number of joints of the antennæ.

Among Fitch's insects is a card bearing six and a ball of cocoons to which is attached a label marked "G. C. Bignell,"

* Mr. Harwood also considers this to be Marshall's writing.

† *Nouv. Mém. Ac. Brux.* 1835, p. 179.

beneath the card is the number 155. (Figs. 6 & 7.) As Bignell's collections and MSS. are now in the Municipal Museum, Plymouth, I wrote to the Curator, who very kindly supplied me with a copy of the following note which Bignell had placed against the number 155 in his diary: "*M. collaris*, bred from *Noctua triangulum*, July 19th, 1881 (80), from G. F. Mathew." No doubt these are the insects recorded by Bignell as *M. collaris* in his list of the Braconidæ of S. Devon,* and by Fitch (Entom. xvi. p. 69).

It seems probable that Bignell, suspecting his specimens to be distinct from *M. collaris*, sent them to Fitch for advice, and that for some reason or other they were never returned.

In June, 1908, the larva of an Agrotid was brought to me, which immediately burrowed on being placed in a tin box with an inch or two of earth; this depth of soil was evidently insufficient, for a day or two afterwards I found that the caterpillar had come to the surface again, where it was lying in an apparently comatose state, and a large number of parasite larvæ were feeding upon it. These parasites were arranged in two irregular rows, one on either side of the unfortunate caterpillar. The host had already shrunk in size, and three days later had entirely disappeared, with the exception of the skin and the chitinous parts of the head. By this time the parasite larvæ, to the number of seventy or eighty, had more than doubled in size and commenced spinning an ochreous web round themselves, but being in an unnatural position were not successful in forming the usual ball. Probably owing to this many died, but a few succeeded in making their cocoons, and duly emerged. Unfortunately I have not these few specimens before me now, but I have little hesitation in referring them to this species.

I may mention that during the past few years I have reared a very considerable number of the larvæ of *Noctua triangulum*, but have not obtained this parasite.

The types are now in the collection of Mr. B. S. Harwood, of Colchester.

(To be continued.)

NOTES ON *PODAGRION PACHYMERUM*, A CHALCID PARASITE OF MANTIS EGGS.

By C. B. WILLIAMS, B.A., F.E.S.

On May 17th, 1913, an ootheca of *Mantis religiosa* was kindly sent to me by Mr. Hugh Main from Lugano, Italy. Towards the end of May and the beginning of June a number

* Trans. Dev. Ass. for Adv. Science, 1901, xxxiii. pp. 657-692.